

AMENDMENTS TO THE DRAWINGS

The attached sheet of drawings includes changes to FIG. 1. This sheet, which includes FIG. 1, replaces the original sheet including FIG. 1.

Attachment: Replacement Sheet

REMARKS

Favorable reconsideration of this application, in light of the preceding amendments and the following remarks, is respectfully requested.

Claims 1-20 are pending in this application. Claims 1, 4, 13-16 and 18-20 are amended. No claims are cancelled by this Amendment.

Drawings

The drawings are objected to as failing to comply with 37 C.F.R. 1.84(p)(5) because FIG. 1 fails to show the binary source labeled as reference character 102 in at least paragraph [0033] of the specification. Accordingly, an attached replacement sheet is submitted herewith labeling the binary source as 102 in FIG. 1.

Therefore, Applicants respectfully request that the objection to the drawings be withdrawn.

Specification

Applicants are currently not aware of any errors included in the specification.

Claim Objections

Claim 16 is objected to. In particular, the Examiner asserts that claim 16 should recite “accumulator decoder” instead of “accumulator decoding”. However, Applicants respectfully submits that claim 16 recites a detector performing MIMO trellis detection and accumulator decoding. Accordingly, Applicants respectfully submit that this claim objection is improper and respectfully request the objection be withdrawn.

Claim Rejections under 35 U.S.C. § 112

Claims 13-19 stand rejected under 35 U.S.C. § 112, second paragraph as indefinite for lacking sufficient antecedent basis. In light of this rejection, claim 13 is

amended to recite “outputting reliability values, ... and a second node decoder for determining modified reliability values from the outputted reliability values.”

Therefore, Applicants respectfully request that the rejection to claims 13-19 under 35 U.S.C. § 112, second paragraph be withdrawn.

Claim 16 stands rejected under 35 U.S.C. § 112, second paragraph as indefinite. However, Applicants respectfully submit that the arguments provided above with respect to the claim objection of claim 16 also apply to this rejection.

Therefore, in light of the arguments provided above, Applicants respectfully request that the rejection to claim 16 under 35 U.S.C. § 112, second paragraph also be withdrawn.

Example Embodiments

Before turning to the outstanding art rejections, Applicants would briefly like to discuss example embodiments and the amended claims. Example embodiments described in specification are directed towards a method of transmitting data in a communication system, which includes encoding and decoding a data stream including check-biregular, nonsystematic repeat-accumulate codes. In particular, paragraphs [0024] and [0025] of the specification recite, *inter alia*, the following.

An iterative, check-regular, nonsystematic RA decoder requires degree $d_c > 1$ to approach capacity, yet does not even begin to converge for such cases. ... This problem may be solved by making the check node layer ‘bi-regular’, the check nodes have either degree 1 or degree d_c . More generally, a nonzero fraction of the check node degrees must be 1. As this enables a successful start to iterative decoding, check-biregular, nonsystematic RA (BNRA) codes are used in accordance with the exemplary embodiments of the present invention. Hereafter, for purposes of clarity, BNRA codes will be referred to as nonsystematic repeat-accumulate (RA) codes. (emphasis added)

Claims

At least the mentioned portion of the specification provides support for the amendments to the independent claims shown in the Amendment to the Claims section of this Amendment. For example, amended independent claim 1 now recites “encoding bits of a data stream with check-biregular, nonsystematic repeat-accumulate codes.”

Independent claims 4, 13 and 20 are somewhat similarly amended.

Claim Rejections under 35 U.S.C. § 102

Claims 13 and 15 stand rejected under 35 U.S.C. § 102(e) as anticipated by Ashikhmin et al. (U.S. Publication No. 2004/0002309, herein Ashikmin). Applicants respectfully traverse this rejection as detailed below.

Applicants note that amended claim 13 recites “a detector for performing a bit detection of a data stream including check-biregular, nonsystematic repeat-accumulate codes received on one or more channels to provide a detector output.”

Ashikhmin is directed to a MIMO system having a channel decoder matched to a MIMO detector, which involves the use of low density parity check codes (LDPCs) as channel codes, but makes no mention of nonsystematic repeat-accumulate codes, much less check-biregular, nonsystematic repeat-accumulate codes. Accordingly, Ashikhmin fails to disclose each and every feature of amended claim 13 or claim 15 depending from claim 13.

Therefore, Applicants respectfully request the rejections of claims 13 and 15 under 35 U.S.C. § 102(e) be withdrawn.

Claim Rejections under 35 U.S.C. § 103

Claims 1 and 3:

Claims 1 and 3 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Jin et al. (U.S. Patent No. 7,116,710, herein Jin) in view of Oelcer et al. (U.S. Patent No. 6,985,536, herein Oelcer). Applicants respectfully traverse this rejection as detailed below.

While Jin may disclose at column 4, lines 12-36 regular repeat and accumulate (RA) codes considered nonsystematic IRA codes, Jin fails to disclose, teach or suggest check-biregular, nonsystematic repeat-accumulate codes. Further, as acknowledged by the Examiner, Jin is silent on mapping encoded bits. Regarding the mapping, the Examiner cites Oelcer col. 3, lines 37-40. However, Applicants respectfully submit the mapping in Oelcer is related to low density parity check (LDPC) codes, but is not applicable to, and Oelcer does not does mention, check-biregular, nonsystematic repeat-accumulate codes.

In light of the above, Applicants respectfully submit that even if Jin and Oelcer are combinable, the combination fails to disclose, teach or suggest “encoding bits of a data stream with check-biregular, nonsystematic repeat-accumulate codes; and mapping the encoded bits to a signal for transmission,” as recited in claim 1. Further, Applicants respectfully submit that claim 3 is allowable at least based on its dependency from claim 1.

Therefore, Applicants respectfully request the rejection of claims 1 and 3 under 35 U.S.C. § 103 be withdrawn.

Claims 2, 4-6, 12 and 20:

Claim 2 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Jin in view of Oelcer, and further in view of Walton et al. (U.S. Patent Publication No. 2004/0081073, herein Walton); claims 4-5 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Oelcer; claim 6 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Oelcer in view of Woerz et al. "Iterative Decoding for Multilevel Codes Using Reliability Information," herein Woerz; claim 12 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Oelcer in view of Woerz, and further in view of Ashikhmin; and claim 20 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Oelcer. Applicants respectfully traverse these rejections as detailed below.

As previously indicated with respect to amended independent claims 1 and 13, Applicants respectfully submit that none of Jin, Oelcer or Ashikhmin disclose, teach or suggest "encoding bits of a data stream with check-biregular, nonsystematic repeat-accumulate codes," as recited in claim 1 or the somewhat similar features of amended independent claim 13. Further, Applicants respectfully submit that claim 20 is allowable over Oelcer at least because claim 20 includes features somewhat similar to independent claim 1. Still further, a cursory review of the Walton and Woerz indicates that Walton and Woerz fail to cure the deficiencies of Jin, Oelcer and Ashikhmin with respect to the independent claims.

Therefore, Applicants respectfully request that the various rejections of claims 2, 4-6, 12, 16 and 20 under 35 U.S.C. §103 be withdrawn.

Allowable Subject Matter

Applicants note with appreciation the Examiner's indication that claims 7-11, 14 and 16-19 would be allowable if rewritten in independent form and amended to address the claim rejections under 35 U.S.C. § 112, second paragraph. Applicants respectfully submit that the rejections under 35 U.S.C. § 112, second paragraph are addressed by the amendments to the claims, but note that these claims including allowable subject matter have been maintained in dependent form.

CONCLUSION

In view of the above remarks and amendments, the Applicants respectfully submit that each of the pending objections and rejections have been addressed and overcome, leaving the present application for condition for formal allowance. A notice to that effect is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to contact the undersigned.

If necessary, the Commissioner is hereby authorized and in this, concurrent, and future replies, to charge any under payment or non-payment of any fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17, or credit any overpayment of such fees, to Deposit Account No. 08-0750, including, in particular, extension of time fees.

Respectfully submitted,

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